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UCF-237DIV

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1 (Second Time Amended) A scintillator detector for high energy radiation comprising : a monocrystalline structure of cerium doped lutetium yttrium orthosilicate, $\text{Ce}_{2x}(\text{Lu}_{1-y}\text{Y}_y)_{2(1-x)}\text{SiO}_5$ where $x =$ approximately 0.00001 to approximately 0.05 and $y =$ approximately 0.0001 to approximately 0.9999.

CANCEL CLAIM 2.

CANCEL CLAIM 3.

4 (First Time Amended). The crystal of Claim 2 wherein x ranges from approximately 0.0001 to approximately 0.001 and y ranges from approximately 0.3 to approximately 0.8.

5 (Second Time Amended). A scintillation detector assembly comprising:
a cerium doped lutetium yttrium orthosilicate mono crystal; and,
a photon detector coupled to said crystal said crystal when exposed to a high energy gamma ray.

CANCEL CLAIM 6.

7 (First Time Amended). The detector assembly of Claim 5 wherein said mono crystal has the general composition of $\text{Ce}_{2x}(\text{Lu}_{1-y}\text{Y}_y)_{2(1-x)}\text{SiO}_5$ where $x =$ approximately 0.00001 to approximately 0.05 and $y =$ approximately 0.0001 to approximately 0.9999.

8. The detector assembly of Claim 7 where in x ranges from approximately 0.0001 to approximately 0.001 and y ranges from approximately 0.3 to approximately 0.8.

9 (First Time Amended). The detector assembly of Claim 5 wherein said coupled photon detector is selected from at least one of a photomultiplier tube, a PIN diode and an APD (avalanche photo detector) diode

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10 (First Time Amended). A method of detecting energy with a scintillation detector,
comprising the steps of:
receiving radiation by a crystal comprising cerium doped lutetium yttrium orthosilicate;
and
detecting photons with a photon detector coupled to the crystal.

11. The method of claim 10, wherein the step of receiving radiation includes the step of:
receiving gamma rays.
12. The method of claim 10, wherein the step of receiving radiation includes the step of:
receiving x-rays.
13. The method of claim 10, wherein the step of receiving radiation includes the step of:
receiving cosmic rays.
14. The method of claim 10, wherein the step of receiving radiation includes the step of:
receiving radiation by a monocrystalline.
15. The method of claim 10, wherein the step of detecting includes the step of:
detecting light with a photo detector coupled to the crystal.
16. The method of claim 15, wherein the step of detecting includes the step of:
detecting light with a photomultiplier tube coupled to the crystal.
17. The method of claim 15, wherein the step of detecting includes the step of:
detecting light with a PIN diode coupled to the crystal.
18. The method of claim 15, wherein the step of detecting includes the step of:
detecting light with a APD diode coupled to the crystal.

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19. The method of claim 10, wherein the crystal includes a composition of $Ce_{2x}(Lu_{1-y}Y_y)_{2(1-x)}SiO_5$ where $x =$ approximately 0.00001 to approximately 0.05 and $y =$ approximately 0.0001 to approximately 0.9999.

Be ¹⁷/₂₀ (First Time Amended). The method of claim ¹⁶/₁₉, wherein x ranges from approximately 0.0001 to approximately 0.001 and y ranges from approximately 0.3 to approximately 0.8.